

ISOTOPICS



ISOTOPIC LABELING FOR DRUG INNOVATION

Marie Skłodowska Curie Action – ITN 2016-2019

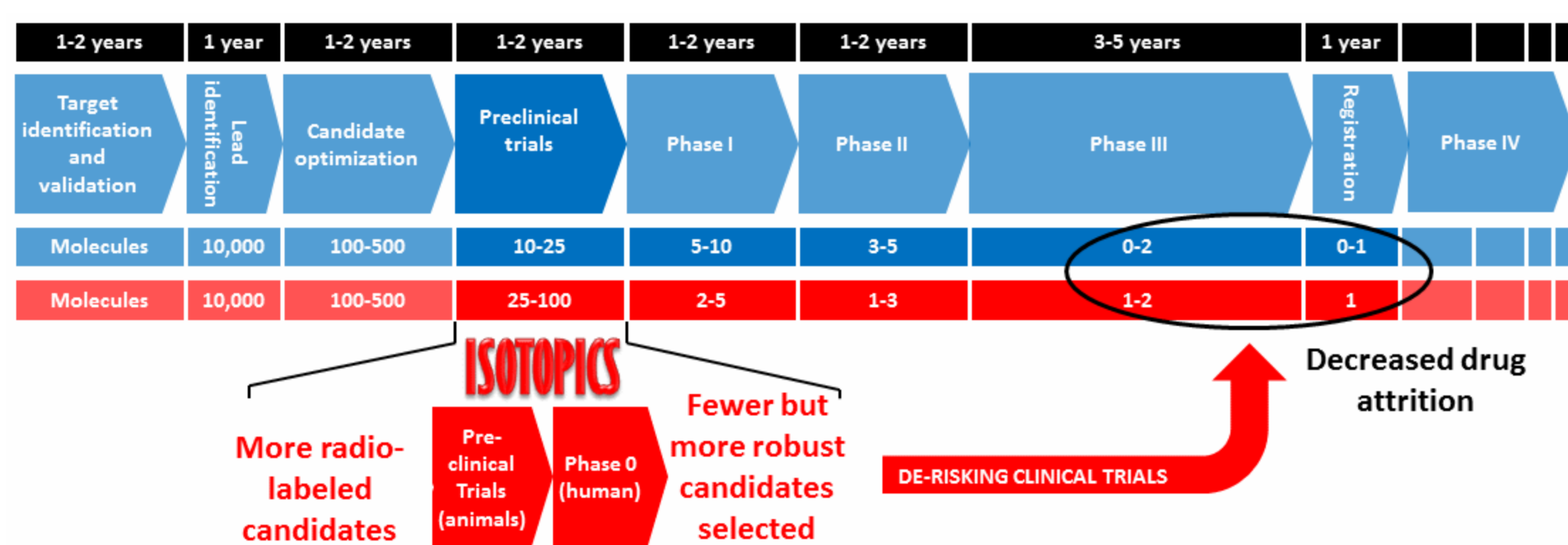
Christophe DUGAVE (Project Coordinator) & Karen HINSINGER (Project Manager)



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★ Context and project aims

Excessive attrition rates during clinical trials dramatically impact on Drug Discovery and Development. Earlier ADMET studies carried out on larger series of drug candidates are expected to derisk drug innovation. Large sets of isotopically-labeled ($^2\text{H}/^3\text{H}/^{11}\text{C}/^{14}\text{C}/^{18}\text{F}$) molecules are therefore required and consequently, new straightforward labeling techniques are urgently needed. Moreover the compelling rise of therapeutic biologics makes necessary the development of new chemically soft methods.



The ISOTOPICS project aims at 1) the development of late-stage, straightforward and chemically benign isotopic labeling methods, 2) the training of a new generation of radiochemists, benefiting from a tight cooperation between academic and industrial partners.

★ Project Implementation

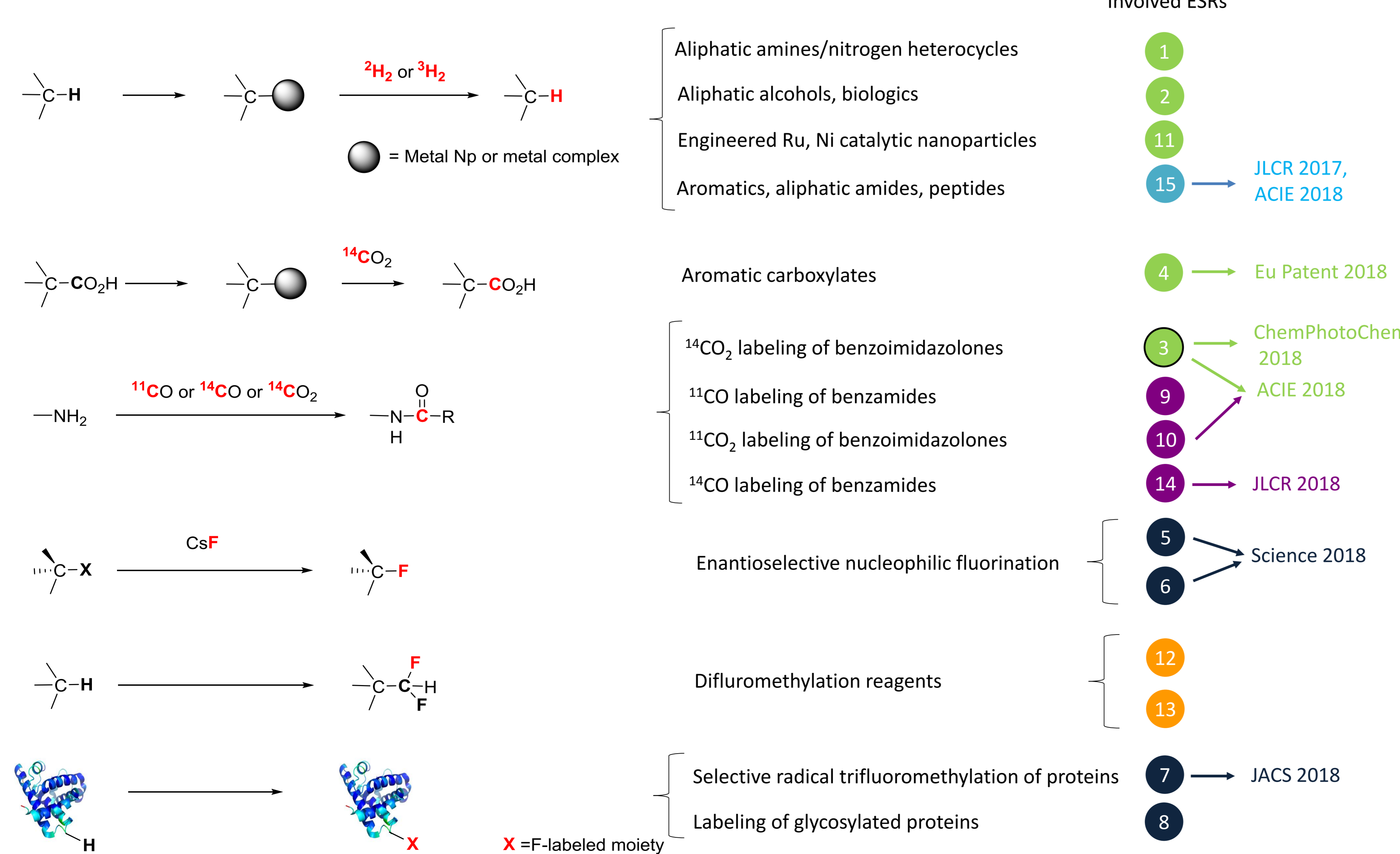
ISOTOPICS is implemented through the combination of lab research, training (including scientific courses and 'complementary skills' workshops) and an intersectorial secondments program in order to improve Early Stage Researcher (ESR) employability. The project is articulated around 6 work packages (WP):



Fifteen PhD students have been recruited (8 females and 7 males) from 8 European and 1 non-European countries (Names of presenting members are highlighted in red):

1. V. Pfeifer (CEA) 2. A. Palazzolo (CEA) 3. A. Del Vecchio (Karolinska Institutet) 4. G. Destro (CEA) 5. F. Ibba (University of Oxford) 6. A. C. Vicini (University of Oxford) 7. M. Imiolek (University of Oxford) 8. M. A. Gafitescu (University of Oxford) 9. M. Ferrat (Karolinska Institutet) 10. K. Horkka (Karolinska Institutet) 11. D. Bouzouita (CNRS) 12. A. Lemos (Université de Liège) 13. L. Trump (Ucb) 14. M. Sardana (AstraZeneca) 15. M. Valero (SANOFI)

★ Projects overview and first results



★ Funding



Project Reference: **675071 H2020-MSCA-ITN-2015**
 EU Contribution: ~ 4 M€
 Period: **2016-2019**

★ Full Beneficiaries

Dr. F. Taran (Deputy Coordinator)
 Dr. G. Pieters ($\text{H}/^2\text{H}$, $\text{H}/^3\text{H}$ exchange)
 Dr. D. Audisio (^{14}C chemistry)
 Dr. T. Cantat (CO_2 chemistry)
 Dr. B. Kuhnast ($^{18}\text{F}/^{11}\text{C}$ chemistries)
 Prof. V. Gouverneur (^{18}F chemistry)
 Prof. B. G. Davis (Biologics labeling)
 Prof. C. Halldin (^{11}C chemistry)
 Prof. B. Chaudret ($\text{H}/^2\text{H}$ exchange)
 Prof. A. Luxen (^{18}F labeling & GMPs)
 Dr. C. Genicot
 Dr. M. Schou
 Dr. C. Elmore
 Dr. V. Derdau
 Mr. S. Roy

★ Advisory Board

Prof. Dr. H. Coenen (DE)
 Dr. P. George (FR)
 Prof. B. Långström (SE)
 Dr. V. Pike (USA)
 Dr. G. Tamagnan (USA)

★ Publications

- Dugave C, *Impact*, 2017, October, 52-54.
- Valero M, Burhop A, Jess K, Weck R, Tamm M, Atzrodt J, Derdau V, J. *Label. Compds Radiopharm.* 2018, 61, 380-385.
- Valero M, Weck R, Güssregen, S, Atzrodt J, Derdau V, *Angew. Chem. Int. Ed.* 2018, DOI: 10.1002/anie.201804010.
- Audisio D, Cantat T, Destro G, "A process for the synthesis of carbon labeled organic compounds" 2018, EP18305407.
- Gotico P, Del Vecchio A, Audisio D, Quaranta A, Halime Z, Leibl W, Aukauloo A, *ChemPhotoChem* 2018, DOI: 10.1002/cptc.201800012.
- Del Vecchio A, Caillé F, Chevalier A, Loreau O, Horkka K, Halldin C, Schou M, Camus N, Kessler P, Kuhnast B, Taran F, Audisio D, *Angew. Chem. Int. Ed.* 2018, Just accepted.
- Bragg R A, Sardana M, Artelsmair M, Elmore C, *J. Label. Compds Radiopharm.* 2018, Just Accepted.
- Pupo G, Ibba F, Ascough D M H, Vicini A C, Ricci P, Christensen K E, Pfeifer L, Morphy J R, Brown J M, Paton R S, Gouverneur V, *Science* 2018, 360, 638-642.
- Imiolek M, Karunanithy G, Ng W-L, Baldwin A J, Gouverneur V, Davis B G, *J. Am. Chem. Soc.* 2018, DOI: 10.1021/jacs.7b10230.
- Dugave C, Hinsinger K, *Open Access Government* 2018, 42, 156-157.